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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,108	12/27/2004	Adriaan Cornelis Kweldam	821405-1010	4000
24504 7590 11/12/2009 THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 600 GALLERIA PARKWAY, S.E. STE 1500 ATLANTA, GA 30339-5994				
EXAMINER				
BEKKER, KELLY JO				
ART UNIT		PAPER NUMBER		
1794				
MAIL DATE		DELIVERY MODE		
11/12/2009		PAPER		

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/502,108
Filing Date: December 27, 2004
Appellant(s): KWELDAM, ADRIAAN CORNELIS

Todd Deveau
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 10, 2009 appealing from the Office action mailed December 3, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 4,423,083	SHENOUDA	12-1983
US 5,300,312	LUSAS et al	4-1994
WO 96/13177	MONSANTO et al	5-1996

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 2, 4-14, and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shenouda (US 4423083) in view of Monsanto (WO 96/13177).

Shenouda teaches a method for the preparation of a ready to consume gelled protein product which is a meat substitute product (Abstract, Column 2 lines 1-5 and 41-49, and Column 9 lines 5-7). Shenouda teaches that the method of preparing the product comprises: combining a milk protein, including whey protein (Column 2 lines 50-68), 0.25-3% sodium alginate, which is a hydrocolloid which precipitates with metal cations (Column 3 lines 21-28), and water (Column 2 lines 13-31), forming the combination into a homogenous mixture (Column 2 lines 38-40 and Column 3 lines 15-20), then mixing the protein alginate composition with a solution containing the gelling agent calcium chloride, i.e. a solution of a metal cation with a valency of at least 2, to form a fibrous product (Column 7 lines 1-36), and isolating the fibrous product by heat setting to form independent fibers and soaking to remove excess salts (Column 7 line 48 through Column 8 line 17). Shenouda teaches that a sequesterant including sodium tripolyphosphate which is a calcium complex forming agent and an alkali metal salt of polyphosphoric acid, is added to the gelled composition (Column 8 lines 15-55). Shenouda teaches that the addition of non-coagulating materials with the protein alginate mixture are desirable (Column 3 lines 29-36). Shenouda teaches that flavoring and fats can be added to the composition (Column 3 lines 1-14). Shenouda teaches that in preparing a meat structure starting from milk protein the pH of the final composition is set to about 7 (Example 8). Specifically regarding claim 24, as Shenouda teaches of forming substantially the same type of product, i.e. a gelled meat from dairy protein and alginate, as the instantly claimed invention, one of ordinary skill in the art at the time the invention was made would expect that the product of Shenouda function substantially the same, including as a sweet or savory product, as the instantly claimed invention.

Shenouda is silent to the combined mixture as formed in the presence of a calcium complex forming agent as recited in claim 1, wherein a mixture of protein and water is made, then the calcium complex forming agent is added to this mixture, and then the alginate is introduced as recited in claim 2, to the sequesterant as sodium polyphosphate (NaPO_3)₂₅ as recited in claim 6 or selected from the group including sodium hexametaphosphate as recited in claim 27, to the amount of sequesterant or phosphate material as recited in claims 7 and 8, to the pH of the homogenous mixture as 4-7 as recited in claim 11, to the pH of the final product as 4.5-6 when forming a fish type structure as recited in claim 13.

Monsanto teaches of forming retort stable dairy protein gels (abstract and page 3 lines 1-4), which were known to be used as meat substitutes, as shown by Shenouda. Monsanto teaches that the method of preparing the product comprises: combining water with gellan gum which is a hydrocolloid which precipitates with metal cations, such as sodium alginate, and then adding dairy protein to the mixture. Monsanto teaches that 0.01-0.1% sequesterant, including sodium hexametaphosphate and trisodium polyphosphate are added to the hydrocolloid mixture before combining the hydrocolloid and protein so that the protein does not precipitate and to facilitate stability in the product. Refer to page 3 lines 32-35, page 5 lines 29-35, and page 6 lines 8-35.

Regarding the combined alginate, i.e. hydrocolloid, and protein mixture as formed in the presence of a calcium complex forming agent, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a sequesterant, i.e. a calcium complex forming agent, with the hydrocolloid or the protein, as it was desirable to include non-coagulating agents in the protein/hydrocolloid mixture as taught by Shenouda and so that when combined the hydrocolloid would have reduced precipitation, i.e. coagulation, with the protein and a stable product would be formed, as taught by Monsanto.

Regarding the order of addition of ingredients, specifically to first forming a mixture of protein and water, then adding a calcium complex forming agent, and then adding alginate, the references teach of first forming a mixture of a hydrocolloid, such as gellan gum or alginate, with a calcium complex forming agent which prevents

precipitation of milk protein, water, and milk protein, wherein the calcium complex forming agent is added to the hydrocolloid before it is combined with the protein. It would have been obvious to switch the order of performing process steps, i.e. the order of the addition of the ingredients into the final mixture such as adding water and then a phosphate to the protein mixture prior to adding alginate, would be obvious absent any clear and convincing evidence and/or arguments to the contrary (MPEP 2144.04 [R-1]). "Selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results". For example, to add the sequesterant or calcium complex forming agent into the hydrocolloid mixture or the protein mixture would have been obvious, as long as the sequesterant was present prior to combining the hydrocolloid and protein, i.e. prior to the protein being exposed to conditions of coagulation; and to combine water to the protein first or after combination with the other ingredients would have been obvious, as long as a homogenous final product was formed. Neither steps provide for new or unexpected results.

Regarding the sequesterant as sodium polyphosphate (NaPO_3)₂₅ or sodium hexametaphosphate, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute one functional equivalent, i.e. sequesterant or calcium complex forming phosphate, such as sodium tripolyphosphate, for another functional equivalent, such as sodium polyphosphate (NaPO_3)₂₅ or sodium hexametaphosphate as taught by Monsanto depending on which sequesterant or calcium complex forming phosphate was more available at the time the invention was made. To substitute one functional equivalent for another would not make a patentable distinction to the claims absent any clear and convincing arguments and/or evidence to the contrary.

Regarding the amount of sequesterant or phosphate material, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include 0.01-0.1% of sequesterant, including phosphate materials which are calcium complex forming agents, in order to prevent the protein from precipitating and to form a stable product as taught by Monsanto. Specially regarding the amount of calcium complex forming agent as at least sufficient to form a complex with free calcium ions which are

present, as the references teach substantially the same amount, including 0.1% of the calcium complex forming agent and as the references teach that the amount is sufficient to prevent precipitation of the protein, such as from free calcium ions, one of ordinary skill in the art at the time the invention was made would expect that the amount of calcium complex forming agent would at least sufficient to form a complex with the present free calcium ions, as instantly claimed. Furthermore, to choose an amount of sequesterant or phosphate material depending on protein precipitation level would have been obvious and routine determination of one of ordinary skill in the art at the time the invention was made and would not impart a patentable distinction to the claims, absent any clear and/or convincing arguments and/or evidence to the contrary.

Regarding the pH of the homogenous mixture before mixing with the metal cation as 4-7, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the pH of the homogenous mixture in order to effect gelling as taught by Shenouda (Column 7 lines 3-7). To determine an appropriate pH would have been obvious and routine determination of one of ordinary skill in the art at the time the invention was made as taught by Shenouda.

Regarding the pH of the final product as 4.5-6 when forming a fish type product, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the pH of the final product depending on the final texture desired as taught by Shenouda (Example 8). For example, Shenouda teaches to form chicken meat the texture is adjust to a pH of about 7 (Example 8); when it was desirable to form a final product with less texture than chicken meat, such as fish, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the pH to less than about 7, such as 6. To adjust the pH of the final mixture based on the desired texture would have been obvious and routine determination of one of ordinary skill in the art at the time the invention was made as taught by Shenouda.

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shenouda (US 4423083) in view of Monsanto et al (WO 96/13177), further in view of Lusas et al. (US 5300312).

Shenouda teaches a method for the preparation of a meat substitute product as discussed above. Shenouda is silent to the meat substitute product as pasteurized as recited in claim 21 or as packaged as recited in claim 22.

Lusas teaches of a meat substitute product which may contain animal proteins (Abstract and Column 4 lines 40-45). Lusas teaches that the product is pasteurized in order to minimize the extent of future microbial proliferation and spoilage (Column 4 lines 62-68). Lusas teaches that the product may be packaged so that it may be sold in vending machines and at news stands (Column 7 lines 1-8).

Regarding the meat substitute product as pasteurized, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pasteurize the meat substitute product as taught by Shenouda in order to prevent future microbial proliferation and spoilage as taught by Lusas.

Regarding the meat substitute product as packaged, it would have been obvious to one of ordinary skill in the art at the time the invention was made to package the substitute meat product, as taught by Shenouda, so that it could be conveniently sold in locations such as in vending machines and on news stands as taught by Lusas.

(10) Response to Argument

Appellant's arguments filed August 10, 2009 have been fully considered but they are not persuasive. Appellant presents four basic arguments which are not convincing as discussed below.

Appellant argues that no prima facie case of obviousness has been established to support the rejection because no adequate rationale was provided that Shenouda and Monsanto are combinable to lead one of skill in the art to the method as instantly claimed (Brief, Appellant point 1, pages 4-10).

Appellant argues point 1 by stating that Shenouda and Monsanto are directed towards different methods and that Monsanto is only relevant to heated gellan gums, and thus it would not have been obvious to combine the references. Appellant's argument is not convincing as the test for obviousness is not whether the features of a

secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references; Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art; i.e. what the references would suggest to one of ordinary skill in the art of dairy protein gels. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Regardless both references and respective methods are directed towards dairy protein gels formed by hydrocolloids with ion exchange in calcium salt solutions, including calcium chloride (Shenouda, column 7 lines 1-24 and column 2 lines 32-68 and Monsanto, page 6 lines 7-18, page 3 lines 5-13, and page 5 lines 27-28). Additionally, as stated above, Shenouda teaches that non-coagulating materials with the protein alginate mixture are desirable (Column 3 lines 29-36); Monsanto teaches that 0.01-0.1% sequesterant, including sodium hexametaphosphate and trisodium polyphosphate are added to the hydrocolloid mixture before combining the hydrocolloid and protein so that the protein precipitation, such as by coagulation, is reduced, and to facilitate stability in the product (page 3 lines 32-35, page 5 lines 29-35, and page 6 lines 8-35); thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include 0.01-0.1% sequesterant, i.e. a calcium complex forming agent, including sodium hexametaphosphate and trisodium polyphosphate, with the hydrocolloid or the protein, as it was desirable to include non-coagulating agents in the protein/hydrocolloid mixture as taught by Shenouda and so that when combined the hydrocolloid would have reduced precipitation, i.e. coagulation, with the protein and a stable product would be formed, as taught by Monsanto.

Appellant argues point 1 by stating that there are fundamental differences between alginate and gellan gum gels, however, states no specific instances, reasons, or examples as to the differences and as to why the teachings of one gel would not apply to the other. Appellant's argument is not convincing as both alginate and gellan gum are hydrocolloids that form gels with ion exchange, as both references teach of dairy protein gels, and as the teaching of Monsanto to add a sequesterant in the early

stages of processing the gel relates specifically to the protein, which is universal to both references, and not to the specific hydrocolloid.

Appellant argues point 1 by asking the question of why one would want to prevent the protein precipitation as taught by Monsanto as Shenouda teaches of coagulating, i.e. protein precipitation, to form a gel product. Appellant's argument is not convincing as Monsanto teaches of reducing, not preventing protein precipitation (page 6 lines 29-35) and as Shenouda teaches that non-coagulating materials with the protein alginate mixture are desirable (Column 3 lines 29-36). As stated above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include 0.01-0.1% sequesterant, i.e. a calcium complex forming agent, including sodium hexametaphosphate and trisodium polyphosphate, with the hydrocolloid or the protein, as it was desirable to include non-coagulating agents in the protein/hydrocolloid mixture as taught by Shenouda and so that when combined the hydrocolloid would have reduced precipitation, i.e. coagulation, with the protein and a stable product would be formed, as taught by Monsanto.

Appellant argues point 1 by stating that Shenouda does not teach of steps b-d of the instantly claimed method. Appellant's argument is not convincing as the instantly claimed steps b-d recite, "b) the composition from step a) [protein, alginate, and water] is formed into a homogenous mixture, c) the homogenous mixture from b) is mixed with a solution of a metal cation with a valency of at least 2 in order to form a fibrous product, d) the fibrous product is isolated"; and as Shenouda teaches that the method of preparing the product comprises: combining a milk protein (Column 2 lines 50-68), alginate (Column 3 lines 21-28), and water (Column 2 lines 13-31), forming the combination into a homogenous mixture (Column 2 lines 38-40 and Column 3 lines 15-20), then mixing the water protein alginate composition with a solution containing the gelling agent calcium chloride, i.e. a solution of a metal cation with a valency of at least 2 to form a fibrous product, i.e. a product containing fibrous bundles (Column 7 lines 1-36), and isolating the fibrous product by heat setting to form independent fibers and soaking to remove excess salts (Column 7 line 48 through Column 8 line 17).

Appellant argues point 1 by arguing that Shenouda forms its fibers by mixing, freezing, and slicing without the use of a metal cation and that the use of the metal cation is to gel the alginate in the fiber bundles not to form the fibers. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the production of fibers without mixing, freezing, and slicing and the use of a metal cation to form fibers) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Thus, appellant's argument is not convincing as the instantly claimed invention recites the use of "a metal cation with a valency of at least 2, in order to form a fibrous product"; the instantly claimed invention does not require the actual fibers be formed by the metal cation; and as stated above, Shenouda teaches mixing the water protein alginate mixture with a solution containing the gelling agent calcium chloride, i.e. a solution of a metal cation with a valency of at least 2 to form a fibrous product, i.e. a product containing fibrous bundles (Column 7 lines 1-36).

Appellant argues that no prima facie case of obviousness has been established to support the rejection because Shenouda and Monsanto teach away from their combination and thus would not to lead one of skill in the art to the method as instantly claimed (Brief, Appellant point 2, pages 4 and 10-12).

Appellant supports point 2 by arguing that Monsanto seeks to reduce or prevent protein precipitation whereas Shenouda teaches a processing which heating is required to coagulate and permanently fix the protein in fibrous form. Appellant's argument is not convincing as Shenouda teaches that non-coagulating materials with the protein alginate mixture are desirable (Column 3 lines 29-36) and as Monsanto teaches of reducing, not preventing protein precipitation by adding a non-coagulating agent (page 6 lines 29-35).

Appellant supports argument 2 by arguing that Shenouda teaches of using a sequesterant after the mixture of protein, alginate, and water has been gelled by ion

infusion and Monsanto teaches that it is critical to add the sequesterant agent before the addition of calcium ions. Appellant's argument is not convincing. Although Shenouda teaches of using a sequesterant after the mixture of protein, alginate, and water has been gelled by ion infusion Shenouda also teaches that non-coagulating materials with the protein alginate mixture are desirable (Column 3 lines 29-36) and as Monsanto teaches of reducing, not preventing protein precipitation by adding a non-coagulating agent which is a sequesterant (page 6 lines 29-35). An additional step in which a sequesterant is added as taught by Monsanto does mitigate the later step of the sequesterant after the mixture of protein, alginate, and water has been gelled by ion infusion as taught by Shenouda.

Appellant supports argument 2 by arguing that Monsanto teaches that a sequestering agent is only needed if calcium ions are added to the gellan gum solution at or near boiling temperature and Shenouda teaches that the calcium ions are added at a low temperature. Appellant's argument is not convincing as it is unclear as to where Monsanto teaches that the sequestering agent is *only* effective for stabilization with gellan gum and at high temperatures and as the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; the test for obvious is not whether the references teach of solving the same or substantially the same problems; nor is it that the claimed invention must be expressly suggested in any one or all of the references; Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art; i.e. what the references would suggest to one of ordinary skill in the art of dairy protein gels. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Appellant argues that no prima facie case of obviousness has been established to support the rejection because modification of Shenouda with Monsanto renders Shenouda inoperable for its intended purpose and thus would not to lead one of skill in the art to the method as instantly claimed (Brief, Appellant point 3, pages 4 and 12).

Appellant supports point 3 by arguing that if the two methods were combinable the use of a sequesterant to Shenouda's method prior to infusion of gelatin ions into the

frozen bundles would likely interfere with the gel-inducing action of the calcium ions and thus the sequesterant would have to be added after infusion with the calcium ions but prior to heat coagulation in which case the sequesterant would interfere with the coagulation of the protein by heat. Appellant's argument is not convincing. As stated above, to add the sequesterant or calcium complex forming agent into the hydrocolloid mixture or the protein mixture would have been obvious, as long as the sequesterant was present prior to combining the hydrocolloid and protein and ion infusion, i.e. prior to the protein being exposed to conditions of coagulation. One would have been motivated for the sequesterant to be added prior to combining the hydrocolloid and protein and ion infusion, since the purpose of the sequesterant agent is to reduce coagulation of the protein which occurs by heat and/or ion exchange. Specifically regarding appellant's argument that the use of the sequesterant would interfere with the coagulation of the protein by as Shenouda teaches the addition of a non-coagulating agent, which would inherently limit or reduce the coagulation of the protein, is desirable, one of ordinary skill in the art would expect that reduced coagulation of the protein is also desirable.

Appellant supports point 3 by arguing that the use of the method of Monsanto would eliminate the later use of a sequestering agent as taught by the method of Shenouda. Appellant's argument is not convincing as the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; the test for obviousness is not whether the references teach of solving the same or substantially the same problems; nor is it that the claimed invention must be expressly suggested in any one or all of the references; Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art; i.e. what the references would suggest to one of ordinary skill in the art of dairy protein gels; See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); and as motivation from a secondary reference to include an earlier processing step, such as addition of the sequestering agent for stabilization as taught by Monsanto, does not eliminate the teachings of the other later processing steps, such as a sequestering agent for texture modification, as taught by Shenouda.

Appellant argues that no prima facie case of obviousness has been established to support the rejection because Shenouda and Monsanto are drawn to solving different problems and thus would not lead one of skill in the art to the method as instantly claimed (Brief, Appellant point 4, pages 4 and 13-14).

Appellant supports this argument by stating that Shenouda teaches of a meat analog and Monsanto teaches of heat stable gel pieces for stabilizing aqueous foods and has nothing to do with meat. Appellant's argument is not convincing as both references teach dairy protein gels which are exposed to calcium ion precipitation and which are formed by hydrocolloids, including gellan gum and alginate. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; the test for obvious is not whether the references teach of solving the same or substantially the same problems; nor is it that the claimed invention must be expressly suggested in any one or all of the references; Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art; i.e. what the references would suggest to one of ordinary skill in the art of dairy protein gels. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant case, as stated above, Shenouda teaches that non-coagulating materials with the protein alginate mixture are desirable (Column 3 lines 29-36); Monsanto teaches that 0.01-0.1% sequesterant, including sodium hexametaphosphate and trisodium polyphosphate are added to the hydrocolloid mixture before combining the hydrocolloid and protein so that the protein does not precipitate, such as by coagulation, and to facilitate stability in the product (page 3 lines 32-35, page 5 lines 29-35, and page 6 lines 8-35); it would have been obvious to one of ordinary skill in the art at the time the invention was made to include 0.01-0.1% sequesterant, i.e. a calcium complex forming agent, including sodium hexametaphosphate and trisodium polyphosphate, with the hydrocolloid or the protein, as it was desirable to include non-coagulating agents in the protein/hydrocolloid mixture as taught by Shenouda and so that when combined the hydrocolloid would have

reduced precipitation, i.e. coagulation, and a stable product would be formed, as taught by Monsanto.

Appellant argues that claims 21 and 22 are non-obvious because claim 1 is non-obvious over the cited references. As stated above, claim 1 is obvious and thus appellant's argument is not convincing.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Kelly Bekker/

Kelly Bekker

Conferees:

/Keith D. Hendricks/
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